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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/010,525

12/06/2001

Robert S. Chau

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1842

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11/30/2004

Michael A. Bernadicou
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP
Seventh Floor
12400 Wilshire Boulevard
Los Angeles, CA 90025-1030

EXAMINER

VU, QUANG D


ART UNIT

PAPER NUMBER

2811

DATE MAILED: 11/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/010,525	CHAU ET AL.	
	Examiner	Art Unit	
	Quang D Vu	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30,32,36 and 37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 30,32,36 and 37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 30, 32, 36 and 37 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 30 recite the limitation "the third thickness at least twice a sum of the first thickness and the second thickness". The specification never discloses the claimed limitation of claim 30.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 30, 32, 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,168,072 to Moslehi and US Patent No. 5,124,762 to Childs et al.

Regarding claim 30, Moslehi et al. (figures 2-9) teach a method of forming a semiconductor device comprising:

forming a gate electrode (50) having a first thickness on a gate dielectric layer (51) formed on a substrate (38);

forming a pair of source/drain regions (64) on opposite sides of the gate electrode (50);

forming a semiconductor material layer (silicon germanium layer [68 and 66]; column 14, lines 1-20) having a second thickness on the gate electrode (layer [68] formed on the gate electrode layer [50]; figure 9) and on the source/drain regions (layer [66] formed on the source/drain regions [64]; figure 9);

forming a silicide layer (72) having a third thickness on the semiconductor material (68);
and

forming a pair of sidewall spacers (60) having a height (a height measured from a top portion of sidewall spacer to a bottom portion of sidewall spacer which is in direct contact with the gate dielectric) above (the height of sidewall spacers is higher than the height of the silicide layer) the third thickness of the silicide layer (72) on the semiconductor material layer (68) on the gate electrode (see figure 9).

Moslehi teaches the first thickness (1000 angstroms) of the gate electrode (50; column 11, lines 28-35) and the second thickness (4000 angstroms) of the semiconductor material layer (68; column 14, lines 13-20). Therefore, the sum of the first thickness of the gate electrode and the second thickness of the semiconductor material layer is 5000 angstroms. Moslehi differs from the claimed invention by not showing the third thickness of silicide at least twice a sum of the first thickness of gate electrode and the second thickness semiconductor material. However,

Art Unit: 2811

Childs et al. teach a silicide layer (26), which is 10,000 angstroms (column 2, lines 26-29).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include the thickness of the silicide layer as taught by Childs et al. into the Moslehi's device in order to reduce the resistivity of the gate electrode. The combined device shows the third thickness of silicide (10,000 angstroms) at least twice a sum (5,000 angstroms) of the first thickness of gate electrode and the second thickness semiconductor material.

Regarding claim 32, the combined device shows the sidewall spacers (Moslehi; 60) comprise silicon nitride (Moslehi; column 12, line 60 – column 13, line 5).

Regarding claim 36, the combined device shows the gate electrode (Moslehi; 50) comprises polysilicon (Moslehi; column 11, lines 28-35).

Regarding claim 37, the combined device differs from the claimed invention by not showing the sidewall spacers are less than 300 angstroms in width. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the sidewall spacers are less than 300 angstroms in width in order to prevent impurities from coming directly into the channel. Furthermore, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Response to Arguments

Applicant's arguments with respect to claims 30, 32, 36 and 37 have been considered but are moot in view of the new ground(s) of rejection.

Art Unit: 2811

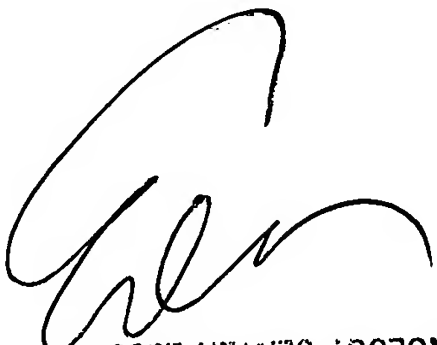
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quang D Vu whose telephone number is 571-272-1667. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

qv
November 10, 2004


EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800